Star.	Mag.	Phase.	Mean Time.			Remarks.
			h	m	s	
a	7	Disappearance	11	59	24·7	Disappearance sudden.
b	$8\frac{1}{2}$	,,	12	49·4		(Approx.)
c	8	,,	13	2	19·3	} Disappearances near upper
d	8	,,	13	5	0·2	} limb : a little uncertain.
e	8	Reappearance	13	6	18·7	
a	7	,,	13	25	4·2	(Approx.)
f	7	Disappearance	13	36	24·2	{ Uncertain to a second, owing to increasing brightness of limb.

The noted time of the reappearance of the star *a*, owing to a temporary removal of the eye from the telescope, was probably two or three seconds late. The Moon's disk was of a copper hue throughout the total phase, and continued distinctly visible both to the naked eye and in the telescope. The southern limb was remarkably bright at the middle of the eclipse. The meridian transit of the first limb was pretty well observed, but the second limb was too faint. The copper and dark green tints were again observed after the total phase, that portion of the obscured surface next to the centre of the shadow being copper-tinted, and the outline of the shadow being very dark green. The telescopic observations during the eclipse were all made with my refractor of $3\frac{1}{4}$ inches aperture, and 48 inches focal length, furnished with a magnifying power of about 30.

Windsor, New South Wales, Jan. 26, 1870.

A few further Notes on the Floor of Plato.
By W. R. Birt, Esq.

In my communication on the floor of *Plato*, which was read at the Meeting of the Society in November last, I solicited attention to a feature presented by the spots, and which I ventured to term " degree of visibility." The paper had reference to twenty-five spots, the degree of visibility of sixteen being given. The entire number of observations to Sept. 27, 1869, was 238. Since that date the observations have been continued, and greater attention has been given to the subject, and as twelve months' observations are now completed, including a luni-solar year, the following results may not be uninteresting.

The number of spots which have been seen on the floor of *Plato* up to the present time is thirty-five, eight of which have been detected since Sept. 27, 1869. The number of observations since that date amounts to 531, being more than double the number (240) during the first six lunations of the year 1869, April to 1870 March inclusive. In the following table the " degree of visibility " of each spot is given for the first six lunations, the last six lunations, the increase or decrease of visibility of

those spots which are comparable, and the " degree of visibility " of each spot for the year, the number of observations being 771.

No.	April to Sept. Obs.	Vis.	Oct. to March. Obs.	Vis.	Diff.	Year. Obs.	Vis.
0	..	..	5	·070	..	5	·048
1	33	1·000	71	1·000	..	104	1·000
2	1	·030	6	·084	+·054	7	·067
3	24	·727	68	·958	+·231	92	·885
4	28	·848	62	·873	+·025	90	·865
5	20	·606	30	·423	−·183	50	·481
6	8	·242	24	·338	+·096	32	·308
7	8	·242	8	·113	−·129	16	·154
8	..	..	3	·042	..	3	·029
9	5	·151	20	·282	+·131	25	·240
10	6	·182	5	·070	−·112	11	·106
11	1	·030	14	·197	+·167	15	·144
12	3	·091	1	·014	−·077	4	·038
13	16	·485	12	·169	−·316	28	·269
14	20	·606	30	·423	−·183	50	·481
15	1	·030	2	·028	−·002	3	·029
16	12	·364	20	·282	−·082	32	·308
17	22	·666	62	·873	+·207	84	·808
18	1	·030	6	·084	+·054	7	·067
19	17	·515	10	·141	−·374	27	·260
20	3	·091	5	·070	−·021	8	·077
21	..	..	4	·056	..	4	·038
22	10	·303	15	·211	−·092	25	·240
23	1	·030	3	·042	+·012	4	·038
24	..	..	5	·070	..	5	·045
25	..	..	9	·127	..	9	·085
26	..	..	1	·014	..	1	·010
27	..	..	2	·028	..	2	·019
28	..	..	1	·014	..	1	·010
29	..	..	6	·084	..	6	·058
30	..	..	8	·113	..	8	·077
31	..	..	1	·014	..	1	·010
32	..	..	6	·084	..	6	·058
33	..	..	1	·014	..	1	·010
34	..	..	5	·070	..	5	·048

On running the eye along the column of differences it will be seen that the number of spots in which an increase has taken place during the last six lunations is nearly equal to that in which a decrease has occurred, viz. ten of the former and eleven of the latter. Spot No. 3, a craterlet, has manifested the greatest increase, while spot No. 19 has exhibited the largest decrease.

The extent of variation of the separate spots is very irregular, and does not appear to indicate the operation of any general law. In one or two instances only have neighbouring spots been simi-larly affected ; thus spots Nos. 5 and 14 in the S.W. quadrant of *Plato*, exhibit the same *decrease* of visibility, and the way in which they have varied from lunation to lunation is somewhat similar, and unlike the manner in which most of the other spots have varied. Spots No. 2 and 18 exhibit the same *increase* of visibility. The great increase of white spots in every part of the Moon's disk, about the time of full, dependent upon the value of $\mathbb{C} - \odot$ would, lunation after lunation, contribute to a steady value of the degree of visibility rather than the irregularity which is indicated by the observations if the *same* spots had been seen month after month. Although the observations amount to 771, and as many as twenty-two spots have been observed on one evening, the average number visible at any given time, as de-duced from the 108 series of observations, is seven only, a number which is constant. Upon examining those series in which a smaller number than seven has been recorded, it is found that, besides the spots most commonly seen, viz. Nos. 1, 3, 4, and 17, the remaining two have not been the same. The additional spots seen on these occasions have been very various, several of them having low degrees of visibility, and some of these, which it might be expected could be seen only in the finest weather, have been observed in ordinary states of the Earth's atmosphere.

The observations of the twelve lunations ending in March, 1870, extend considerably the basis on which to found an in-telligible explanation of the phenomena, it is, nevertheless, much too narrow to hazard more than conjecture. Another year's ob-servations will doubtless throw further light on the subject.

On the Graphical Construction of the Umbral or Penumbral Curve at any instant during a Solar Eclipse. By Prof. Cayley.

The curve in question, say the penumbral curve, is the intersection of a sphere by a right cone,—I wish to show that the stereographic projection of this curve may be constructed as the envelope of a variable circle, having its centre on a given conic, and cutting at right angles a fixed circle ; this fixed circle being in fact the projection of the circle which is the section of the sphere by the plane through the centre and the axis of the cone, or say by the axial plane. The construction thus arrived at is Mr. Casey's construction for a bicircular quartic ; and it would not be difficult to show that the stereographic projection of the penumbral curve is in fact a bicircular quartic.

The construction depends on the remark that a right cone is the envelope of a variable sphere having its centre on a given line, and its radius proportional to the distance of the centre